Transformation Investigations

Answer the questions in your book.

Task 1 - Reflecting a Polygon

1. What can you see?
   1. The object is named …
   2. The image is named …
   3. The dotted line is …
2. Drag A, B or C to form a different triangle. What happens?
3. Drag D or E. What happens to the image?
4. Show the side lengths and drag some of the points.  
   What can you say about the lengths?
5. Show the vectors to describe how each point has transformed.  
   What do you notice about the vectors?
   1. How are they the same?
   2. How are they different?
6. Use them to describe where the image of an object occurs
7. Are any points invariant? (They don’t change position when reflected)

Task 2 – Rotating a Polygon

1. What can you see?
2. Drag the slider control to the right.  
   What happens?
3. What path do the points follow?  
   Show the loci of the points to confirm this.
4. What is point D called?
5. Which direction do the points rotate?  
   Describe how you could rotate the other direction.
6. Show the side lengths and drag A, B or C to change the shapes.  
   What do you notice?
7. Are any points invariant? (They don’t change position when shape rotates)

Task 3 – Translating a Polygon

1. What can you see?
2. Drag A, B or C to form a different triangle. What happens?
3. The green line DE is called a vector. What properties does it have?
4. Drag D or E – what happens to the image.
5. Show the point loci  
   How are they related to the vector DE?
6. What can you say about the loci of all the points?
7. How is this different from
   1. A reflection?
   2. A rotation?
8. Are any points invariant?
9. How can you describe a transformation?

Task 4 – Enlarging a Polygon

1. What can you see?
2. Drag the object triangle – what happens to the image?
3. Show the centre point  
   How are the image and object related to the centre point?  
   You can also drag the centre point.
4. Drag the value of k on the slider  
   What does the value of k show?
5. When k>1 what can you say about the image?
6. When k=1 what happens?
7. When k is between 0 and 1 what happens?
8. When k=0 what happens?
9. When k<0 what happens?
10. Are any points invariant for k=2?
11. How can we make a selected point invariant?